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Re.: Substitute pages

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P:\Translations\P06,0313 - translation, substitute PCT pages - Verfahren zum Bedrucken eines Aufzeichnungsträgers.doc

SUBSTITUTE PAGES

Patent claims

1. Method for printing of a recording medium,

- in which potential images of the images to be printed are generated on a potential image carrier (101),
- in which, to develop the potential images, a liquid developer is used that comprises a transparent polymerizable carrier fluid and charged colorant particles suspended therein,
- in which developer is transported via an applicator roller (201) to the potential image carrier (101) in a quantity that is constant per time and area,
- in which a developer film forms in the developing zone between the potential image carrier (101) and the applicator roller (201) for development of the potential images,
  - which developer film, adjacent to the potential image carrier (101), comprises an photo-polymerizable liquid enriched with colorant in regions in which potential images are present on the potential image carrier (101) and comprises a photo-polymerizable liquid depleted of colorants in regions in which no potential images are present (image film [sic]),
  - which developer film splits at the end of the developing zone into the image film adhering to the potential image carrier (101), which image film comprises the developed potential images, and a film adhering to the applicator roller made, which film is made up of photo-polymerizable liquid with residual colorants,
- in which the image film with the developed potential images are transferred from the potential image carrier (101) onto the recording medium (402) such that the colorant and a portion of the photo-polymerizable liquid in which the colorants are arranged migrates [sic] from the image film,
- in which the image film with the potential images to be developed are, as images to be printed, fixed on the recording medium (402) with a UV radiation such that the colorants of the developed potential images are embedded in a solid, transparent polymer mass via photo-polymerization;

otherwise the photo-polymerizable liquid is solidified into a transparent film.

2. Method according to claim 1,
in which the photo-polymerizable liquid is high-ohmic.

3. according to any of the preceding claims,
in which the photo-polymerizable liquid comprises acrylester.

4. Method according to any of the preceding claims,
in which the liquid developer is produced via suspension of solid particles (made up of pigments, coated pigments or toner particles with pigments or, respectively, dyes) in the photo-polymerizable liquid.

5. Method according to claim 4,
in which charge control substances that influence the charging of the suspended solid particles is added to the photo-polymerizable liquid.

6. Method according to claim 4 or 5,
in which initiators that accelerate the photo-polymerization of the liquid are added to the photo-polymerizable liquid.

7. Method according to claim 4, 5 or 6,
in which surface tension-influencing and viscosity-controlling agents are added to the photo-polymerizable liquid.

8. Method according to any of the claims 4 through 7,
in which the proportion of solid particles in the liquid developer is > 10%.

9. Method according to any of the claims 4 through 8,

in which the composition of the photo-polymerizable liquid and of the solid particles suspended therein is selected such that the solid particles in the photo-polymerizable liquid charge with a preferred polarity.

10. Method according to any of the claims 4 through 9,
in which such a bias voltage is applied to the applicator roller (201) that the transition of the solid particles of the liquid developer into the image areas of the potential image carrier (101) is aided.

11. Method according to any of the claims 4 through 10,
in which an intermediate image carrier (301) onto which the solid particles and a portion of the photo-polymerizable liquid is [sic] transferred is arranged between the potential image carrier (101) and the recording medium (402).

12. Method according to claim 11,
in which the transfer of the image film and of the photo-polymerizable liquid onto the intermediate carrier (301) or, respectively, recording medium (402) is assisted by an electrical field existing between the intermediate image carrier (301) or, respectively, recording medium (402) and the potential image carrier (101) or intermediate image carrier (301) and recording medium (402).

13. Method according to any of the preceding claims,
in which a removal roller that is brought into contact with the photo-polymerizable liquid is used to reduce the photo-polymerizable liquid.

14. Method according to claim 13,
in which such an auxiliary potential is applied to the removal roller that the solid particles inking the potential image are repelled by the removal roller.

15. Method according to claim 13 or 14,

in which the photo-polymerizable liquid is reduce by approximately 50% by the removal roller.

16. Method according to any of the preceding claims,
in which, given multi-color printing, the various color separations are successively applied to the potential image carrier (101) and successively transferred onto the recording medium (402) or intermediate carrier (301).

17. Method according to any of the claims 1 through 15,
in which, in multi-color printing, the color separations are collected on the potential image carrier (101) and are subsequently transferred into the recording medium (402) or intermediate carrier (301).

18. Method according to the preceding claims,
in which the UV fixing is optimized via adjustment of the spectral distribution and power density of the radiation.

19. Method according to the preceding claims,
in which a radiation source is used for the fixing that radiates a combination of ultraviolet light, visible light and infrared radiant heat.

20. Method according to claim 19,
in which the wavelength of the ultraviolet light lies in the range from 200 to 400 nm.

21. Method according to claim 19 or 20,
in which the wavelength of the visible light lies in the range from 400 to 700 nm.

22. Method according to claim 19, 20 or 21,
in which the wavelength of the radiant heat lies in the range from 700 to 10 μm.

23. Method according to any of the claims 19 through 22,
in which the radiation is adjusted such that the visible light and the radiant heat generate the heat required for activation of the for the [sic] photo-polymerization and the UV radiation cures the photo-polymerizable liquid.

24. Method according to any of the claims 19 through 23,
in which the wavelengths of the radiation are selected such that the print image is additionally provided with gloss and/or is additionally abrasion-resistant.

25. Method according to any of the claims 20 through 24,
in which the wavelength of the UV radiation is set from 320 to 400 nm when a greater penetration depth and a more significant volume effect in the recording medium (402) should be achieved.

26. Method according to any of the claims 20 through 24,
in which the wavelength of the UV radiation is selected from 280 to 320 nm when a smaller penetration depth and a more significant curing of the print image on the surface of the recording medium (402) should be achieved.

27. Method according to any of the claims 20 through 24,
in which the wavelength of the UV radiation is selected form 200 to 280 nm when a more significant curing of the surface of the print image on the recording medium (402) should be achieved.

28. Method according to claim 27,
in which an inert gas is used when an intensified surface hardening should be achieved.

29. Method according to claim 28,
in which nitrogen is used as an inert gas.

30. Method according to any of the claims 19 through 29,
in which the recording medium is exposed to a corona exposure before and/or after the UV curing.

31. Method according to claim 30,
in which corona radiation, infrared radiation, visible light and UV radiation of the wavelength 320 to 400 nm is [sic] combined when a good liquefaction [sic] of the print image and a good bonding with the surface of the recording medium (402) should be achieved with high surface gloss.

32. Method according to any of the claims 18 through 31,
in which a post-fixing with a UV radiation of the wavelength 200 to 280 nm is implemented when a hard surface of the print image should be achieved.

33. Method according to any of the claims 20 through 31,
in which a roller stamping can follow given a UV pre-fixing with reduced power density.

34. Method according to the preceding claims,
in which a UV radiation is used to increase the viscosity of the image film.

35. Method according to claim 34,
in which the image film is additionally exposed to a corona radiation.

36. Method according to claim 34 or 35,
in which the viscosity increase of the image film is such that the transfer printing of the image film onto the recording medium (402) occurs via contact pressure.

37. Electrographic printer or copier device,
in which transfer-printed print images (503) is [sic] fixed on a recording medium (402) according to the method according to any of the preceding claims.